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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/547,415	04/11/2000	Faquir C. Jain	CONN-2	4421

7590 01/30/2002
Hung Chang Lin
8 Schindler Court
Silver Spring, MD 20903

EXAMINER

GARRETT, DAWN L

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 01/30/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

T.D-9

Office Action Summary

Application No.

09/547,415

Applicant(s)

JAIN ET AL.

Examiner

Dawn Garrett

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-8,10-16,18,20,22,25-27,29 and 38-44 is/are pending in the application.
- 4a) Of the above claim(s) 2,11,13-16,18,20,22,25-27,29 and 38-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-8,10,12 and 44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicants' election with traverse of claims 1, 3, 5-8, 10, 12, and 44 is kindly acknowledged. Applicants' selection of ultimate species $Zn_xCd_{1-x}Se(\text{core})-Zn_yMg_{1-y}Se(\text{cladding})$ for claim 3 and $Zn_aMg_{1-a}Se$ for claim 5 is also kindly acknowledged. Claims 2, 11, 13-16, 18, 25-27, 29, and 38-43 drawn to non-elected species are withdrawn. Claims 1, 3, 5-8, 10, 12, and 44 are currently under consideration.

Information Disclosure Statement

2. The listing of references in the specification (instant specification, page 22) is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

3. The drawings are objected to because Figure 2(a) is missing a number between numbers (14) and (16).

Specification

4. The disclosure is objected to because of the following informalities: On page 2, line 16, "(30" should be changed to "(3)".

Appropriate correction is required.

Claim Objections

5. In claim 1, it is suggested that "thin-layer" be changed to "thin layer".
6. In claim 3, "CNC layer are selected" should be changed to "CNC layer is selected".
7. In claim 5, "seleced" should be changed to "selected".
8. In claim 8, "further_comprises" should be changed to "further comprises".
9. Claim 10 is objected to because of the following informalities: In claim 10, "sublayers" should be changed to "sublayer". Also, "white-light" should be "white light". Furthermore, a period should be added at the end of claim 10. Appropriate correction is required.
10. Claim 44 is objected to because of the following informalities: The word "a" should be inserted before "technique". Appropriate correction is required.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
12. Claims 1, 3, 5-8, 10, and 12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. It is not seen where the specification describes the material one would use for the "p-doped wide energy gap semiconductor" and "thin wide energy gap semiconductor layer" of claim 1. Page 12 of the

specification states "Wider energy gap semiconductor layers...can be selected and patterned...from a wide ranging material list", but does not specifically state what those materials are.

13. Also, it is not seen where the specification supports "sublayers stacked to emit different colors and white-light" of claim 10.

14. It is not seen where the specification clearly describes how to achieve "avalanche mode" (per instant claim 6) and "injection mode" (per instant claim 7). Additionally, it is not seen where the specification clearly describes how to reverse-bias or forward-bias the device.

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16. Claims 1, 3, 5-8, 10, and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

17. The phrase "multiple layers" in claim 1 is unclear, because the intended order of the multiple layers is unclear. In claim 1, it is unclear if the EL device comprises the layers in the same order as recited. Clarification is required.

18. The word "first" in the phrase "first p-doped Si layer" is indefinite, because there is not a "second" "p-doped Si layer" recited.

19. Claim 1 recites "bottom electrodes". The word "bottom" is indefinite, because the claim does not establish what is the top and bottom of the device.

20. Claim 1 recites "thin-layer of Si". The word "thin" is considered to be a relative term, which renders the claim indefinite. The term "thin" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

21. Claim 1 recites "p-doped wide energy gap semiconductor layer". The word "thin" is considered to be a relative term, which renders the claim indefinite. The term "thin" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

22. Claim 1 also recites "a thin wide energy gap semiconductor layer". Both terms "thin" and "wide" are considered to be relative terms, which render the claim indefinite. The terms "thin" and "wide" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

23. Claim 1 recites "a metal layer forming a plurality of top contact electrodes deposited on the wide energy gap semiconductor layer". It is unclear upon which wide energy gap semiconductor layer the metal layer is deposited, since both "p-doped" and "thin" wide energy gap semiconductor layers are recited earlier in the claim.

24. Claim 1 recites "appropriate patterned regions". The word "appropriate" is considered indefinite and the specification does not clearly define the term.

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25. Claim 1 recites “desired pixels”. The word “desired” is an indefinite term and the specification does not clearly define “desired”.

26. In claim 3, the variables “x” and “y” are considered indefinite as it is not defined in the claim.

27. The variables “a”, “b”, and “c” in claim 5 are indefinite as their definitions have not been given.

28. Claim 5 recites “CNC layer is sandwiched between compatible wide energy gap semiconductors”. It is unclear if the “wide energy gap semiconductors” are the same as the “p-doped wide energy gap semiconductor layer grown epitaxially” and the “thin wide energy gap semiconductor layer having n-type conductivity” of claim 1. Clarification and correction with regard to antecedent basis is required.

29. The word “compatible” in claim 5 is indefinite. The specification does not state which semiconductors which are compatible or noncompatible.

30. In claim 8, the multiple layers of CNCs is unclear. It is assumed the multiple layers comprise differing CNC materials, because otherwise the multiple layers in combination would comprise one layer of common material. Clarification is requested.

31. Claim 8 recites “CNCs sandwiched between epitaxially grown thin film layers of wide energy gap semiconductors”. It is unclear if the “wide energy gap semiconductors” are the same as the “p-doped wide energy gap semiconductor layer grown epitaxially” and the “thin wide energy gap semiconductor layer having n-type conductivity” of claim 1. Clarification and correction with regard to antecedent basis is required.

32. Claim 44 recites "bottom electrodes". The word "bottom" is indefinite, because the claim does not establish what is the top and bottom of the EL device.

33. Regarding claim 44, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

34. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

35. Claims 1, 3, 5-8, 10, 12, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. (US 6,147,365). Fischer et al. teaches an optoelectronic semiconductor component (see abstract). The device comprises a semiconductor substrate and front and rear contacts (see col. 8, lines 5-18 and col. 7, lines 46-55). The device comprises various layers of semiconductor materials (see col. 3, line 15 through col. 6, line 53). Fischer et al. teaches ZnCdSe and ZnMgSSe are cladding semiconductor materials known in the prior art (see col. 1, lines 32-35). Fischer et al. discloses Si or SiC may be used as substrate material in addition to GaAs and other compounds (see col. 10, lines 32-34). It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to have made an EL device comprising multiple layers as recited in instant claims 1, 3, 5-8, 10, 12, and 44, because all materials of these claims are generally taught by Fisher et al.

Conclusion

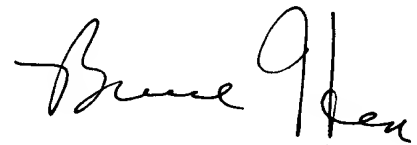
36. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (703)305-0788. The examiner can normally be reached Monday through Friday from 9:00 a.m. to 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on (703)-308-0449. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2351.

D.G.
January 27, 2002

A handwritten signature in black ink, appearing to read "Bruce H. Hess". The signature is fluid and cursive, with the first name "Bruce" and last name "Hess" clearly distinguishable.

BRUCE H. HESS
PRIMARY EXAMINER